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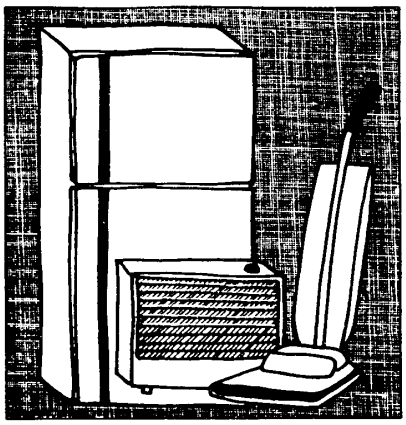
APRIL 1987



APPLIANCE ENERGY CONSIDERATIONS

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Appliances use about 8 percent of the energy in a typical North Dakota home. Some of these uses are highly visible and represent everyday usage. Others are seldom used, and as a result their energy usage is low. Cooking equipment is the largest user of energy in the home next to space and water heating.

The average home will have about 30 appliances. Some homes have as many as 95 small appliances. However, there is a wide variation in the amount of use the various appliances get. For example, an Ohio survey revealed that 36 percent of the owners of hard top hair dryers did not use them. Other items that had large percentages of owners who did not use them included deep fat fryers, toaster ovens, warming trays and hair setters (Table 1).

Items that were used frequently included hand held hair dryers, steam irons, vacuum cleaners, shavers, can openers, coffee makers and toasters. Surprisingly, those people who used hair setters used them frequently, with an average of 120 uses per year (Table 2).

The total energy usage of an appliance is a combination of the energy demand (wattage), the length of time the appliance is used and the total number of times it is used per month or year. A man's shaver may be used 365 times per year, but since it has an electrical demand of only 15 watts and is used for an average of five minutes per day, it only uses half a kilowatt hour per year. On the other hand, an ice cream freezer that is used only six times per year with an electrical demand of 160 watts will use 0.6 kilowatt hour per year (Table 3).

Appliances with high annual energy use include electric blankets, frypans, and slow cookers. Typically, heating appliances will have higher energy usage than motor type appliances.

Table 1. Percent of Owners of Appliances Who Did Not Use Them.

Appliance	% Non-Users
Blender	11
Can Opener	7
Coffee Maker	11
Corn Popper	25
Deep Fat Fryer	33
Frypan/Skillet	18
Ice Cream Freezer	14
Standard Mixer	4
Hand Mixer	2
Slow Cooker	4
Toaster Oven	30
Waffle Iron	18
Warming Tray	33
Electric Knife	12
Steam Iron	7
Dry Iron	28
Upright Vacuum	*
Canister Vacuum	2
Men's Shaver	17
Women's Shaver	28
Hair Dryer (Hard Top)	36
Hair Dryer (Hand Held)	3
Hair Setter	34
Bed Covering	22
Clock	*
Toaster	0

*Indicates less than 1 percent of the owners did not use this appliance.

Appliance energy labels have been in use since 1980. Their purpose is to help purchasers evaluate the energy use of an appliance and to make it easier to compare the efficiency of similar appliances. The labels have been required on refrigerators, freezers, dishwashers, clothes washers, water heaters, furnaces and room air conditioners.

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Table 2. Number of Times Small Appliances Were Used Per Year.

Appliance	Average Number of Times Used	Maximum Number of Times Used
Waffle Baker	15	130
Warming Tray	33	365
Steam Iron	82	1,000 +
Dry Iron	54	365
Upright Vacuum	171	1,000 +
Canister Vacuum	113	730
Men's Shaver	308	1,000 +
Women's Shaver	52	208
Hair Dryer (Hard Top)	60	365
Hair Dryer (Soft Bonnet)	60	365
Hair Dryer (Hand Held)	300	1,000 +
Hair Setter	120	1,000 +
Bed Covering	160	730
Blender	53	730
Can Opener	433	1,000 +
Coffee Maker	334	1,000 +
Corn Popper	39	365
Deep Fat Fryer	32	182
Frypan/Skillet	103	730
Ice Cream Freezer	7	52
Standard Mixer	96	546
Hand Mixer	110	546
Knife	19	365
Slow Cooker	50	234
Toaster	346	1,000 +
Toaster-Oven	139	730

Ranges and clothes dryers do not have labels, because there is little difference in energy use between comparable models. Individual usage patterns are more important than the particular appliance efficiency.

There are three types of labels, a generic label for furnaces, an energy efficiency rating label for air conditioners and an appliance label for other appliances which includes an estimated annual operating cost (Figure 2, 3, 4 and 5).

The labels indicate the most and least energy efficient models available and how the model with the label compares. The label does not tell you if the appliance you are looking at is typical, average or unique in its energy efficiency.

Compare appliances that are similar in size, type and features. For example, front loading washers typically use less water (21 to 30 gallons) than top loading washers (34 to 40 gallons) and as a result will use less energy, since the energy for heating the water is included on the energy use label. The same cycle on a compact washer uses from 16 to 30 gallons per load.

Table 3. Estimated Energy Used by Small Appliances.

Product	Representative Operating Wattage	No. of Uses Per Year	Time/Use (Min.)	Hours/ Year	% Actual "On" Time*	kWh/ Year
Baby Food Warmer	165	1092	7.3	131.0	100	22.0
Bagmaker/Sealer	60	350	1.25	7.3	100	0.4
Blanket	150	180	480.0	1440.0	50	108.0
Blender	300	293	0.5	2.4	100	0.7
Broiler	1200	100	45.0	75.0	100	90.0
Can Opener	100	1000	0.2	3.3	100	0.3
Coffe Maker/Percolator						
Brew Cycle	600	600	15.0	150.0	100	90.0
Warm Cycle	80	600	60.0	600.0	100	48.0
Coffee Maker/Drip						
Brew Cycle	1100	600	9.5	95.0	100	104.5
Warm Cycle	70	600	60.0	600.0	100	42.0
Coffee Mill	150	360	0.5	3.0	100	0.4
Corn Popper						
Hot Air	1400	100	5.0	8.3	100	11.6
Oil	575	100	9.0	15.0	100	8.6
Curling Iron	40	300	10.0	50.0	82	1.6
Cooker Dryer/Dutch Oven	1200	35	60.0	35.0	54	22.7
Crepe Maker	750	52	30.0	26.0	70	13.6
Deep Fryer						
Regular	1500	50	50.0	41.6	50	31.2
Mini	600	50	30.0	25.0	70	10.5
Egg Cooker	600	175	5.0	14.6	100	8.8
Fondue/Chafing Dish	800	25	60.0	25.0	46	9.0
Food Grinder	200	100	15.0	25.0	100	5.0
Food Slicer	100	52	10.0	8.7	100	0.9
Frypan	1200	180	45.0	135.0	62	100.4
Griddle	1200	100	30.0	50.0	76	45.6
Hair Clipper	10	200	10.0	33.3	100	0.3

*Factor for the effect of on-off cycle in thermostatically controlled products.

Table 3 (continued)

Product	Representative Operating Wattage	No. of Uses Per Year	Time/Use (Min.)	Hours/ Year	% Actual "On" Time*	kWh/ Year
Hairdryer						
Soft Bonnet	400	100	45.0	75.0	100	30.0
Hard Bonnet	900	100	30.0	50.0	100	45.0
Hand-Held	1000	250	8.0	33.3	100	33.3
Hair Setter	350	156	15.0	39.0	75	10.2
Hamburger Maker	750	100	20.0	33.3	90	22.5
Heating Pad	60	52	120.0	104.0	54	3.4
Hot Beverage Maker						
Instant	1000	600	3.0	30.0	100	30.0
Ice Cream Freezer	130	6	45.0	4.5	100	0.6
Ice Crusher	100	100	3.0	5.0	100	0.5
Iron	1100	52	120.0	104.0	52	59.5
Juicer	125	100	2.0	3.3	100	0.4
Kettle	1500	600	5.0	50.0	100	75.0
Knife	95	90	5.0	7.5	100	0.7
Knife Sharpener	40	52	5.0	4.3	100	0.2
Lighted Mirror						
Incandescent	50	650	10.0	108.3	100	5.4
Fluorescent	20	650	10.0	108.3	100	2.2
Massager						
Hand-Held	15	104	10.0	17.3	100	0.3
Foot	135	100	30.0	50.0	100	6.8
Mixer						
Hand	100	150	5.0	12.5	100	1.3
Stand	150	75	8.0	10.0	100	1.5
Pizza Maker	600	52	20.0	17.3	100	10.4
Roaster	1425	12	360.0	72.0	58	60.0
Rotisserie	1400	26	120.0	52.0	100	73.0
Shaver	15	365	5.0	30.0	100	0.5
Shaving Cream						
Dispenser	60	365	1.0	6.0	100	0.4
Slow Cooker	200	104	400.0	693.0	100	138.6
Table Range	1250	100	30.0	50.0	75	46.9
Table Clothes Washer	100	100	30.0	50.0	100	5.0
Toaster	1100	700	3.0	35.0	100	38.5
Toaster-Oven/Broiler						
Toasting	1500	500	3.0	25.0	100	37.5
Oven	1500	280	30.0	140.0	26	54.6
Broiler	830	156	30.0	78.0	71	45.9
Toothbrush with						
Charger	1.1	Cont.	Cont.	8760.0	100	10.0
Waffle Baker/						
Sandwich Grill	1200	52	30.0	26.0	80	24.9
Warming Tray	140	26	120.0	52.0	50	3.6
Yogurt Maker	25	26	600.0	260.0	40	2.6

Another shortcoming of the labels is that labels on manual defrost refrigerators and freezers will show lower energy usage. But, if you do not regularly defrost them when the frost is one-fourth inch thick, they will use more energy than an automatic defrost model.

The cost of operating an appliance in your home will be different than that shown on the appliance label because the labels represent averages, and very few families are average.

APPLIANCE STANDARDS

Over the years there have been several attempts to set national appliance efficiency standards. The Department of Energy proposed some regulations but withdrew them, saying that there would be no benefit from a national standard.

Some states then began to set state standards. Because of the variation among states there was a new call for a national standard. National stan-

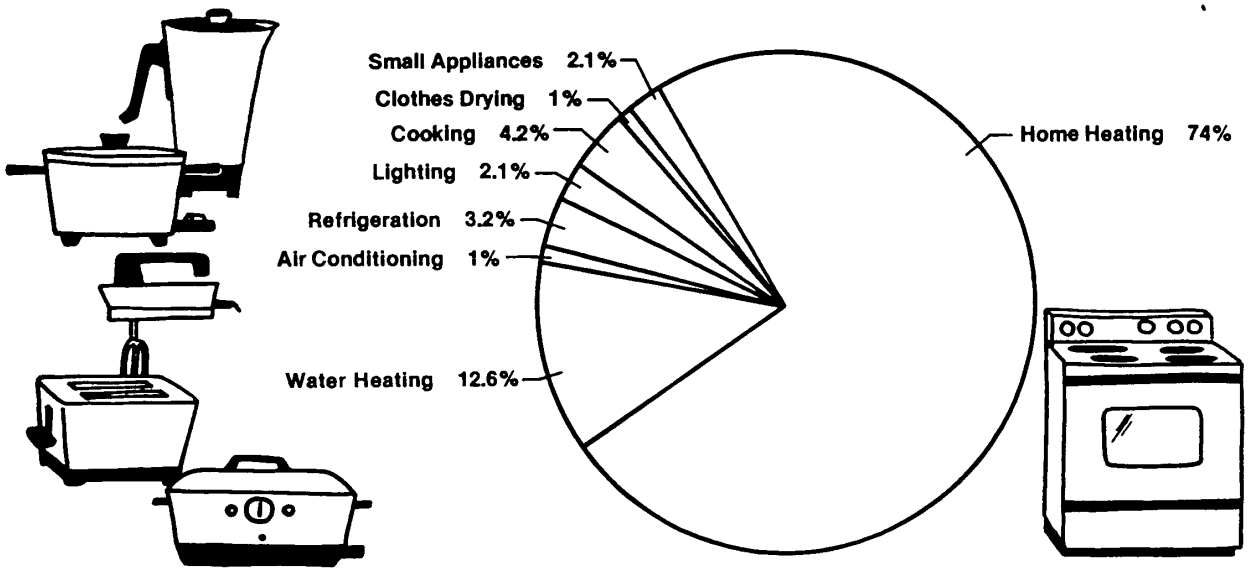


Figure 1. Energy Use in the Home. Appliances use about 13 percent of the home's energy but only about 2 percent of the United States' total energy.

Room Air Conditioner
Capacity: 9500 BTU/hr

(Name of Corporation)
Model(s) XXXXXX

ENERGYGUIDE

Models with the most efficient energy rating number use less energy and cost less to operate.

Models with 9300 to 9799 BTU's cool about the same space.

Least efficient model 5.7

6.1

Most efficient model 10.2

▼ THIS MODEL

Energy Efficiency Rating (EER)

This energy rating is based on U.S. Government standard tests

How much will this model cost you to run yearly?

Yearly hours of use		250	750	1000	2000	3000
		Estimated yearly $ cost shown below				
Cost per kilowatt hour	2¢	$8	$23	$31	$62	$94
	4¢	$16	$47	$62	$125	$187
	6¢	$23	$70	$94	$187	$281
	8¢	$31	$94	$125	$250	$374
	10¢	$39	$117	$156	$312	$468
	12¢	$47	$140	$187	$374	$562

Ask your salesperson or local utility for the energy rate (cost per kilowatt hour) in your area. Your cost will vary depending on your local energy rate and how you use the product.

Important Removal of this label before consumer purchase is a violation of federal law (42 U.S.C. 6302)

Figure 2. A typical label from a room air conditioner. An energy efficiency ratio is given rather than an annual operating cost because of the variation in hours of use in different geographic areas of the U.S.

(For Furnaces)

ENERGYGUIDE

You can save substantially on home heating and cooling energy costs by following the simple steps outlined below:

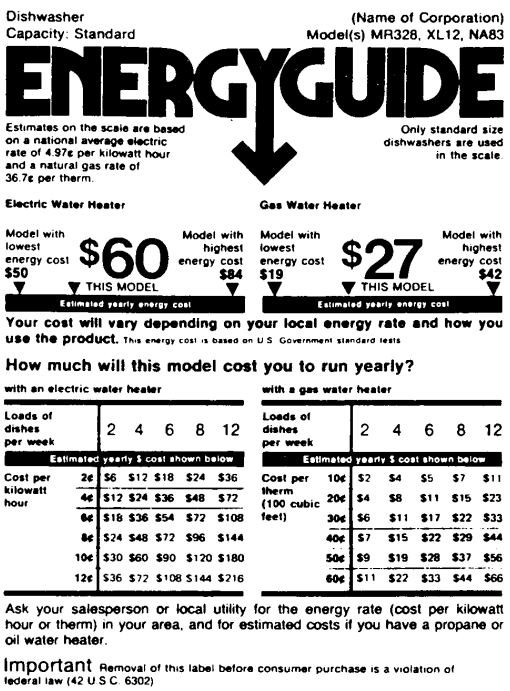
1. Weatherproof your house
2. Assure energy efficient heating and cooling equipment selection and installation
3. Operate and maintain your system to conserve energy.

Help conserve energy. Compare the energy efficiency rating and cost information for this model with others. Check the figures and spend less on energy.

Your contractor has the energy fact sheets. Ask for them.

Important Removal of this label before consumer purchase is a violation of federal law (42 U.S.C. 6302)

Figure 3. A generic label is attached to a furnace offering tips for reducing energy use. For specific information you must ask the dealer for the fact sheets pertaining to that furnace.



Dishwasher
Capacity: Standard

(Name of Corporation)
Model(s) MR328, XL12, NA83

ENERGYGUIDE

Estimates on the scale are based on a national average electric rate of 4.97¢ per kilowatt hour and a natural gas rate of 36.7¢ per therm.

Only standard size dishwashers are used in the scale.

Electric Water Heater

Model with lowest energy cost $50 — $60 — Model with highest energy cost $84

THIS MODEL

Estimated yearly energy cost

Gas Water Heater

Model with lowest energy cost $19 — $27 — Model with highest energy cost $42

THIS MODEL

Estimated yearly energy cost

Your cost will vary depending on your local energy rate and how you use the product. This energy cost is based on U.S. Government standard tests

How much will this model cost you to run yearly?

with an electric water heater

Loads of dishes per week		2	4	6	8	12
Estimated yearly $ cost shown below						
Cost per kilowatt hour	2¢	$6	$12	$18	$24	$36
	4¢	$12	$24	$36	$48	$72
	6¢	$18	$36	$54	$72	$108
	8¢	$24	$48	$72	$96	$144
	10¢	$30	$60	$90	$120	$180
	12¢	$36	$72	$108	$144	$216

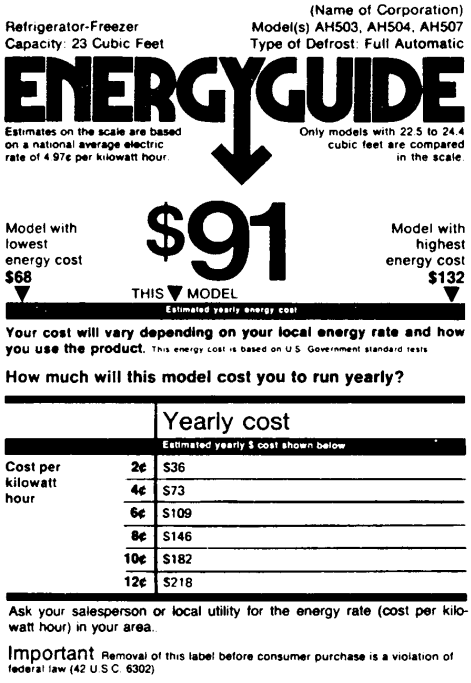
with a gas water heater

Loads of dishes per week		2	4	6	8	12
Estimated yearly $ cost shown below						
Cost per therm (100 cubic feet)	10¢	$2	$4	$5	$7	$11
	20¢	$4	$8	$11	$15	$23
	30¢	$6	$11	$17	$22	$33
	40¢	$7	$15	$22	$29	$44
	50¢	$9	$19	$28	$37	$56
	60¢	$11	$22	$33	$44	$66

Ask your salesperson or local utility for the energy rate (cost per kilowatt hour or therm) in your area, and for estimated costs if you have a propane or oil water heater.

Important Removal of this label before consumer purchase is a violation of federal law (42 U.S.C. 6302)

Figure 4. A dishwasher label. This label included the cost of heating the water for washing dishes. About 80 percent of the energy needed to operate a dishwasher is used to heat the water.



Refrigerator-Freezer
Capacity: 23 Cubic Feet

(Name of Corporation)
Model(s) AH503, AH504, AH507
Type of Defrost: Full Automatic

ENERGYGUIDE

Estimates on the scale are based on a national average electric rate of 4.97¢ per kilowatt hour.

Only models with 22.5 to 24.4 cubic feet are compared in the scale.

Model with lowest energy cost $68 — $91 — Model with highest energy cost $132

THIS MODEL

Estimated yearly energy cost

Your cost will vary depending on your local energy rate and how you use the product. This energy cost is based on U.S. Government standard tests

How much will this model cost you to run yearly?

		Yearly cost
		Estimated yearly $ cost shown below
Cost per kilowatt hour	2¢	$36
	4¢	$73
	6¢	$109
	8¢	$146
	10¢	$182
	12¢	$218

Ask your salesperson or local utility for the energy rate (cost per kilowatt hour) in your area.

Important Removal of this label before consumer purchase is a violation of federal law (42 U.S.C. 6302)

Figure 5. A typical label from a refrigerator/freezer. Carefully check that type, capacity and features are similar on the units you are comparing.

dards were proposed for gas furnaces, air conditioners, water heaters, space heaters, and pool heaters. The proposed standards included provisions for dishwashers to optionally dry without heat; clothes washers would have to include an option to rinse with unheated water, and clothes dryers would not have a constant burning pilot light; gas ranges and ovens equipped with an electrical supply cord would also not have a constant burning pilot light. The bill containing these proposals was signed into law in 1987.

The result of the various attempts at reducing energy used by appliances has resulted in some changes in the way appliances are being built. New clothes washers now offer only a cold setting for the rinse cycle. Some models use 60 percent cold water for the warm wash cycle instead of 50 percent used by some of the older models. Refrigerators are being better insulated and are using smaller cooling units.

NOTE: All of the electrical energy used by an appliance is eventually converted to heat. This is a benefit in the winter but will add to the cooling load during the summer.

Table 4. Yearly Cost to Operate a Freezer at a 12 Percent Inflation Rate.

Year	¢/KWHR	Annual Cost
1	4.0	$ 73.00
2	4.5	81.76
3	5.0	91.57
4	5.6	102.56
5	6.3	114.87
6	7.0	128.65
7	7.9	144.09
8	8.8	161.38
9	9.9	180.75
10	11.1	202.43
		$1,281.06

CALCULATING ENERGY COSTS

A worksheet (see worksheet 1) can be used to calculated the energy costs for any appliance you are considering. Be sure to use your local energy costs. They may be higher or lower than the examples attached to the appliance.

The worksheet enables you to determine how long it will take to recover any extra costs associated with the more energy efficient appliances. Include in your estimates accurate predictions of use. An inefficient appliance that is only used a few hours per year may end up costing less over its lifetime than a more efficient model that costs more.

If you expect fuel costs to rise, be sure to include this in your calculations. If you expect inflation to rise by 5 percent per year, you multiply this year's fuel cost by 1.05 to get next year's cost. The third year's costs will be 1.05 times the second year and so on for the life of the appliance.

Table 5. Possible Annual Savings with Energy Efficient Appliances.

Appliance	Average Existing Appliance	New Energy Efficient Appliance
Electric Water Heater	$240	$120
Gas Water Heater	120	98
Refrigerator (manual defrost)	36	24
Refrigerator (frost-free)	96	57
Freezer (manual defrost)	60	33
Freezer (frost-free)	108	60
Central Air Conditioner	240	120
Room Air Conditioner	48	33
Electric Range	48	40
Gas Range	34	26
Clothes Washer	72	36
Electric Clothes Dryer	56	44
Gas Clothes Dryer	23	18
Dishwasher	56	36
Color Television	20	9
Lights	60	20-40

Source: American Council for Energy Efficient Economy. Annual costs assume an electricity price of 6.0 cents per kWhr. and gas price of 45 cents a therm. The cost of operating a clothes washer and dishwasher includes the cost of water heating.

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WORKSHEET 1

How To Use the Energy Guide Label

First, you need to answer five questions.

1. Are the appliances comparable in size and features?_____

2. What is the price of the energy efficient model? __

   _____

   (model with lower yearly energy cost or higher energy efficiency rating)

3. How often will you use the product?

4. What is your local energy rate? _____¢/kwh

   _____¢/therm

   How much will each model cost you to run yearly, based on your local energy rate? (see grid on appliance label)

   Standard Model_____

   Energy-efficient model

5. How long do you expect to keep the appliance? __

   _____

Then you can figure out whether you are better off buying the more energy-efficient appliance

First, calculate the price difference:
Cost of energy-efficient model $_____
minus cost of standard model −_____
Price difference $_____

Second, estimate your annual energy-cost savings with the more energy-efficient model:
Annual energy cost of standard model $_____
minus annual energy cost of energy-efficient model −_____
Annual energy-cost savings $_____

Third, calculate your energy-cost savings over the life of the appliance:
Annual energy-cost savings $_____
multiply by years you expect to keep the appliance ×_____yrs
$_____
minus price difference −_____
Energy-cost savings over life of appliance $_____

Finally, figure out how soon you can expect to recover your investment:
Price difference $_____
divided by annual energy-cost savings ÷_____
Years to recover investment _____yrs.